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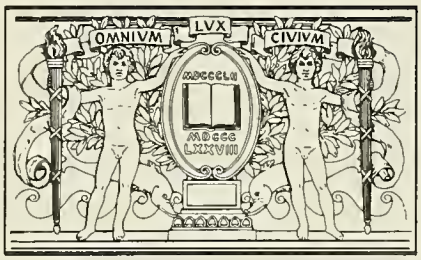

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December 12, 1968

KEVIN H. WHITE
MAYOR

To: CITIZENS OF BOSTON

From: MAYOR KEVIN H. WHITE

Subject: **TRAFFIC WILL MOVE IN BOSTON**

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CITY OF BOSTON

MAYOR'S TRAFFIC TASK FORCE

A TRAFFIC IMPROVEMENT PROGRAM

TASK FORCE

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DECEMBER, 1968

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December 10, 1968

Mayor Kevin H. White
City Hall
Boston
Massachusetts 02108

Dear Mayor White:

We are pleased to submit your report to the people of Boston on the subject of traffic improvement. As you requested, the Police, Public Service and Traffic and Parking Departments worked together in its development. Several other departments also rendered valuable assistance.

The report does not address specific traffic changes. Instead, it offers a set of policies and programs to be adopted and pursued. It is our belief that this approach will make it possible to carry out your stated intent of elevating traffic management in Boston from a caretaker status to a high level of programmed improvement. Once adopted, the policies established should produce some immediate results and should also become the basis for a continuing program.

It has been a genuine pleasure to work with the other departments on this study. It will be a privilege to participate in its implementation.

Yours very truly,

William R. McGrath

William R. McGrath
Commissioner

ACKNOWLEDGMENT

The Task Force has drawn heavily upon the staff resources of numerous City agencies in the preparation of this report. The ideas and concepts which comprise the program represent a joint effort on the part of the following:

Traffic and Parking Department
Police Department
Office of Public Service
Law Department
Redevelopment Authority
Real Property Board
Fire Department
Public Works Department

The Task Force also wishes to acknowledge the assistance of Murray D. Segal, who served as a Consultant throughout the conduct of the study.

A TRAFFIC IMPROVEMENT PROGRAM
CITY OF BOSTON

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SUMMARY OF RECOMMENDATIONS

SUMMARY OF RECOMMENDATIONS

In fulfillment of its assignment, the Mayor's Task Force has reviewed existing traffic programs in the City in a search for ways and means of improving traffic conditions in Boston. The following recommendations constitute a program which offers a substantial potential for improving the quality of traffic flow and reducing the accident toll. In summary, these recommendations are as follows:

(1) The safe and efficient movement of traffic on a selected system of arterial streets should be adopted as first priority, and all possible improvements efforts should be concentrated on this priority system.

(2) The programming of new traffic control devices should be expanded to meet the objectives of traffic movement on the priority street system.

(3) Essential tow zones, fully enforced by towing to convenient locations, should be established. By this means, acute congestion during peak traffic hours can be significantly reduced.

(4) The proper allocation of curb space in critical parking demand areas should be rated as an important need requiring immediate attention.

(5) Current parking regulations should be reviewed with the general objective of bringing them into conformance with the traffic movement and parking program goals. Specific objectives should be increased use of curb parking meters where parking can be permitted and the tailoring of time restrictions along demand guidelines, to achieve better utilization of this scarce commodity.

(6) The allocation of curb space for truck loading purposes should be accomplished on the basis of need and guided by engineering judgement. This program should have the highest priority in the curb space allocation process, since it most seriously affects the movement of traffic. To accomplish this objective, the fee system of establishing loading zones should be abolished because it interferes with engineering judgement.

(7) The enforcement of parking regulations by meter maids has been a substantial success, and this program should be expanded to provide coverage of all critical areas in the City.

(8) The location of taxi zones, bus stops, and all other special curb regulations should be subjected to the test of good traffic movement and parking principles.

(9) The traffic accident records system should be markedly improved through the use of EDP techniques to provide more and better information to more City departments.

(10) The fleet of vehicles operated by the Traffic and Parking Department should be fully equipped with two-way radio, and an interdepartmental line between the Police and Traffic and Parking Departments should be established. By this improved communication line, effective surveillance and control of traffic on the arterial street system can be materially aided.

(11) Legislation affecting traffic control and regulation should be studied in detail, and specific evaluation should be made concerning its compatibility with traffic movement and parking program objectives.

(12) The Traffic and Parking and Police Departments should create and maintain an innovative pedestrian education program. This action is suggested by a substantial number of pedestrian fatalities and will offer a supplementary approach to a difficult enforcement problem.

(13) The Traffic and Parking Department should modernize its management information system to provide more effective and up-to-date data upon which progress of the program can be measured.

INTRODUCTION

A Balanced Transportation System

In recent years cries for a balanced transportation system have been heard from every segment of the community. They have come from the legislator, who is responsible for enacting the laws which might make such a balanced system possible; they have come from the public administrator and technician, whose job it is to build and operate such a system; they have even come from the citizen who is primarily interested in having a safe, sensible, comfortable, convenient, and economical means of conveyance between his home, his work, the places where he shops, and the places where he plays. The need for both highways and rapid transit has been a central theme expressed and implied in this often heard demand, and yet a clear definition of the proper mix of the components of this ideal transportation system has usually been lacking. One thing is certain however, each component should operate safely and at its most efficient level.

This report concentrates solely on a single aspect of a balanced transportation system - namely, the improvement of traffic operations on the city street system. This street system is inseparable from the other parts of a balanced program, serving as the primary cohesive force binding together the other facilities within the system, and providing the means for transfer between travel modes. Within this context, then, it is both necessary and useful to review the other transportation programs which, combined with improved traffic operations on the city streets, are essential to serve the complex transportations demands of the metropolitan area.

Briefly stated, the major components of a balanced program are:

(1) The expansion and improvement of the mass transit system.

(2) The development of new street and highway facilities.

(3) The application of traffic operations techniques to the existing street system.

Most recent public dialogue has centered around the construction of new facilities, both freeway and transit, and this is probably due to the large capital investments required and the significant social inconveniences which are generated. On the other hand, the improvement of traffic operations on the existing street system has been largely overlooked in the metropolitan area and the city, and thus, this aspect of the program is a relatively unknown quantity. This is indeed a paradox because substantial improvements in service to the public can be introduced with investments which are minute in terms of the current rate of capital investment for freeways and transit. In addition, a minimum of inconvenience or neighborhood disruption is involved. In the following pages each of the three program components is reviewed in brief to summarize what has been done in recent years, what is in progress, and what can be expected in the future.

Mass Transit Program

The Massachusetts Bay Transportation Authority (MBTA) is now embarked on a very extensive expansion and improvement of the transit system. Major emphasis has been on the extension of existing rapid transit lines from their current terminals further into the suburban communities.

Improvement to the existing transit system also has taken the shape of new bus equipment for surface operations and a station modernization program. The MBTA is just beginning a thorough study of its subway tunnel operations with a view towards improving distribution in the downtown area.

Basic responsibility for carrying out the extension and the modernization of the existing transit system is vested in the MBTA, although the City can and does exercise the policy influence through the Advisory Board. At the technical and operating level the City has less well - defined responsibilities. Nevertheless, the location and arrangement of transit

stations, the selection of bus routes and stops, the location and configuration of the extensions and new rapid transit lines, and the nature of the downtown distribution system are all deeply related to the effective functioning of the other components of the transportation system.

Street and Highway Construction

Boston now has the beginnings of a basic freeway system which will provide high speed automotive access to all portions of the metropolitan area. Primary responsibility for the construction and operation of this freeway network rests with the State Department of Public Works. The Southeast Expressway, the Massachusetts Turnpike, and the Central Artery complex are completed portions of the network. In the planning stage are the Southwest Expressway and the Inner Belt circumferential route, which would tie all of the radial freeway routes together close to the center of the City. Progress on the construction of this freeway network has been painfully slow in recent years, due both to the very large magnitude of the cost (in excess of $1 billion) and the social inconvenience which has been generated. Aside from taking vigorous steps designed to minimize the social problems involved with the construction of this freeway system, the City has a vital interest in the location and design of the freeway facilities. In terms of traffic operations on the city streets, the most important aspect of the freeway program is the location and layout of the interchanges which will relate the freeway network to the street system. Providing access to the freeway network for the residents of the city, diversion of long haul traffic from the City's arterial streets, and maintenance of good flow conditions in the immediate vicinity of the freeway should be the principal goals.

It is emphasized that a major change in traffic patterns will result from the construction of the freeway system. This change, which will manifest itself in substantial increases in crosstown (i.e., circumferential direction) traffic demand, will be repeated throughout the metropolitan area. As the

freeway system is built, those arterial streets serving the interchange access points will carry increasing traffic loads diverted from the major radial streets. Since capacity is already limited in this direction, the location and design of the freeways and their interchanges must include a careful engineering evaluation by the city.

The Metropolitan District Commission (MDC) is responsible for building and maintaining an extensive system of parkways, both within the city and the metropolitan area. Most of these parkways, located in or adjacent to parks, are prohibited from carrying large size commercial vehicles, and this accentuates the traffic flow problem on the City's arterial streets. Since this parkway system is, in fact, so extensive and handles such a significant portion of the arterial traffic demand, the exclusion of truck traffic places an unusually large number of trucks on the city streets. The coordination of the City's traffic improvement program with the MDC should have as its primary goals the upgrading of the city's arterial streets to efficiently manage the additional truck traffic demand and the continuous monitoring of regulations and devices at those intersections and interchanges where the city street meets the MDC parkway.

Opportunities exist for the city to improve traffic operations by the construction of new street facilities, but they are certainly limited by the nature of the city's land use and development pattern. Other opportunities for improving service will arise, both in and out of urban renewal areas, and coordination of the Public Works Department's street program with the traffic improvement program will go a long way toward ensuring that these opportunities are not lost.

Traffic Operations

The functioning of the transportation system in the City of Boston and the metropolitan area is a complex affair. Part of this complexity is

due to the fluidity of the forces and demands which structure the system. Traffic patterns and traffic volume are changing perpetually from hour to hour and day to day. Since the fixed transportation facilities are by themselves relatively static, a high level of management and technological inputs are required if the system is to respond to demand fluctuations and operate effectively. This report concentrates on the management of traffic flow within the city, hence this program is labelled as "traffic operations".

Engineering and Enforcement are the fewer physical activities through which a traffic operations program is created and maintained. Education of the motorist and the pedestrian is a continuing program element which ensures that engineering and enforcement inputs effort will produce maximum benefits. Safety is an achievement to be sought throughout all program efforts. Within each of these program areas there are many individual activities which are important to the effective management of the transportation system, and they range from the promulgation of sensible regulations, the employment of control devices and enforcement practices to the employment of more substantial programs such as grade separations and selective street widening. It is emphasized that a good operations program is much more than physical maintenance of the street facilities. It is contrasted with the other parts of the balanced transportation program by the relatively large amount of technical services which are required for successful effectuation and the relatively small amount of capital funds that are required. The complete operating budget of the Traffic and Parking Department for the last fiscal year, for example, totalled only a bit more than $1 million, which represents the cost of building only 100 feet of high priced urban expressway.

Responsibility for the engineering aspects of the traffic operations program largely rests with the Traffic and Parking Department; the Traffic and Parking and the Police Departments share enforcement and supervision responsibilities.

The level of operating efficiency on Boston's arterial streets is now extremely low. In certain instances this low level of efficiency can be traced to a surplus of demand for space over the available capacity, but on much of the arterial street mileage the cause is lack of application of sound operating principles.

Boston's arterial street system took shape years before the invention of the motor vehicle, and reached almost complete development before the advent of traffic engineering as it is known today. It is the belief of the Task Force that the application of an effective operations program should have very high priority in the total transportation program. This recommendation is based upon the recognition that the construction of new transit and highway facilities is an extremely expensive proposition, and the application of operational techniques will prove to be a means of attaining maximum use of previous large capital investments and minimizing the need for new facilities. Beyond protecting these past investments and minimizing future capital programs, the improvement in operating conditions will be apparent to the motorist and pedestrian as they encounter fewer daily irritations and inconveniences in their movement about the city.

The improvement of flow conditions on the city's streets will positively affect all segments of the transportation system. Thousands of MBTA patrons will benefit from better and more efficient bus service, which will in turn simplify the integration of the surface and rapid transit schedules and reduce operating costs. Movement between the airport, the railroad and trucking terminals, and the city center will be more efficient and enhance the use of these other modes. Access to and from the freeways and parkways will be easier, and thereby raise the quality of flow on these high capacity, high cost facilities. The home owner will be "bothered" less by the flow of traffic past his door, as the existing "spill over" of vehicles is diverted

from the residential to the arterial street where it rightly belongs. Perhaps the most important benefit of all will be the reduction in accident rates which should parallel improvements in the quality of flow.

This traffic improvement program is offered not as a solution to all the ills affecting transportation in the city, nor merely because it involves a small investment, but because it is so intimately related to all aspects of daily life in the city and metropolitan area that huge savings in operating costs will result from the expenditure of each of the transportation dollars that are applied.

Federal Programs

The concentration in the transportation field on building new facilities has been country-wide, and until recently very small amounts of Federal Aid were available for operations programs. In recent months, however, Congress has authorized a relatively large Federal investment in an operations program aimed at improving traffic flow on existing streets and highways through the application of traffic engineering techniques. This program, called TOPICS (Traffic Operations Program to Improve Capacity and Safety), began in 1967 with a few pilot studies. Recognizing that the program had much to offer, Congress authorized the expenditure of $200 million per year during fiscal 1970 and 1971 to implement the program on a nationwide basis. Funding for this program will be similar to existing procedures in the highway field with the Federal funds being apportioned by the Department of Transportation to each of the fifty state highway departments. The state highway departments will be responsible for administering the program. If past experience with the pilot program can be a guide, a basic requirement for participation will be a comprehensive areawide traffic improvement plan. The preparation

of such a plan for the City of Boston must begin immediately. The Task Force has organized its work so that substantial portions can be utilized in this comprehensive operations blueprint. Nevertheless, much engineering detail work remains to be accomplished.

THE BASICS OF TRAFFIC OPERATIONS

THE BASICS OF TRAFFIC OPERATIONS

Engineering and Operations

The first task involved in the engineering evaluation of the traffic program is the definition of the arterial street system. It is important to distinguish between the arterial street, the collector street, and the purely local street so that regulation and control of traffic will proceed along reasonable priority lines, and program emphasis will be appropriate. The definition and classification of the streets on the network will encourage an efficient concentration of programs which are related to the specific street function. In general, any particular street may provide for the following uses in varying proportions:

(1) The movement of through traffic

(2) Access to and from freeways and parkways

(3) Service to abutting commercial properties

(4) Service to abutting residential properties

(5) Access to and from off-street parking facilities

Only through a careful analysis of the service which each street must provide can sensible regulations be promulgated and observed.

The allocation of curb space to the many different uses which it can serve is perhaps the most time consuming portion of the entire engineering program. The most critical use of the available curb space in the City of Boston is for loading and unloading of commercial vehicles. The distribution of goods throughout the city, most particularly the Central Business District, depends on the use of trucks. Until such time as off-street loading facilities are provided, it is necessary to use curb space for this function. The best interests of the motorist, the shopper, the merchant, and the city in general will be served if adequate curb space is allocated for truck loading and unloading.

Next to the provision of truck loading, the curb allocation problem of most importance to the city is the rationing of auto usage primarily through the installation and maintenance of parking meters. The parking meter is little different in intended function than the traffic signal. When properly applied, it encourages a more equitable use of available curb parking space and time in much the same manner that the traffic signal controls the use of the intersection space between conflicting vehicular paths. Metered curb parking should be encouraged in those locations where traffic flow will not be unduly affected. The purpose of this program is the provision of convenient short-term parking spaces in commercial and other high demand areas. This program requires careful balancing of street space needs for movement and storage purposes.

Traffic signs, signals, and pavement markings are the physical means by which the traffic engineer applies the principles of traffic control, and informs and educates the driver of existing rules and regulations. When properly used, they promote a more orderly and higher quality of flow and generally decrease accident rates. For the most part, the regulations which these devices represent are based on simple common sense principles. It is obvious to even the most naive driver that intersections carrying heavy loads of conflicting traffic must be controlled in some fashion. It is equally obvious to him as he waits for a red light on a main thoroughfare at 3 a.m. that the signal could just as well be on flashing operation. It is critical, then, that these traffic control devices and the regulations they represent be based upon sound engineering principles and careful analysis of factual information.

Continuous surveillance of the street network is necessary to identify specific traffic bottlenecks and to monitor the efficiency of operations.

These specific bottlenecks may result from a myriad of physical or operating deficiencies, and an awareness of their existence is the first step toward providing solutions. As the operation program develops, the need for the more elaborate components, such as street widening, intersection channelization, and even grade separations, will be more clearly defined.

Enforcement and Operations

Effective enforcement begins with logical regulations. The motorist who parks his vehicle in a restricted zone on a wide, one-way street which is carrying only a small number of vehicles has only concluded that the regulation is unwarranted. This, of course, does not imply that the motorist is always correct, but simply that traffic and parking regulations must be tailored to need and must be installed in a precise and meaningful manner. Once this is accomplished, it will become more obvious to the motorist that the imposition of fines is a means of protecting the level of service to the entire motoring public, rather than just a way of collecting revenues. This also implies that the rules and regulations must be fairly and equitably enforced to all concerned. Exempting individuals or groups of individuals from the enforcement program - be they mayors, government employees, or legislators - destroys the integrity of the regulation, and puts an unfair burden on the shoulders of the individuals responsible for enforcement.

The enforcement of parking regulations is a major component of the program and involves the use of parking tickets and towing. A good enforcement program must distinquish between these tools. The parking ticket and its accompanying fine should be imposed on those motorists who have violated the basic principles behind the allocation of curb parking space. It is intended to inform the motorist that parking time limitations, fire hydrant restrictions, bus stops, and other special regulations are there for a purpose and will be enforced

fairly and equitably. In short, the motorist must believe in the regulation and expect the enforcement.

Towing of motor vehicles must be considered in a different light. It should be used in carefully selected locations and where a parked motor vehicle critically affects the safety and efficiency of street operations. One curb parked vehicle on a major arterial street which is loaded to capacity can jeopardize the safe operation of hundreds of motor vehicles per hour, and reduces the traffic carrying capacity of the street by a figure which is greater even than the capacity of the one lane he is blocking. Where the lane is absolutely necessary for movement purposes, the removal of the vehicle is the only alternative to a breakdown of traffic flow.

The observance of traffic controls and turn prohibitions is a subprogram greatly dependent upon proper use of these controls and prohibitions. The key in effective enforcement of these regulations lies in selecting the regulations and locations which have most meaning in terms of traffic volumes and traffic accidents.

Recent studies have clearly shown that differences in speed among vehicles in the traffic stream are more detrimental to safe operation than the level of speed involved. Good traffic operation involves the setting of speed limits on the basis of careful evaluation of the street use and its physical environment. The goal of providing a reasonable level of speed on the arterial system can be met by a combination of the intelligent use of traffic control devices and an effective enforcement program.

Maintaining the flow of traffic on the city street system during periods of snow emergencies requires a careful and well-thought-out planning effort. That portion of the network which is most essential to the movement of people and goods during these conditions must be defined. Priorities must be set on snow plowing and removal operations and integrated with the enforcement of emergency parking regulations. Storage areas must be defined and maintained

for vehicles which require removal from the arterial street system. All of these activities suggest a high level of cooperation and communication between the Police Department, the Traffic and Parking Department, and the Public Works Department. Highest priority during snow storms should be given to the major street system, followed by collector facilities in the areas of high traffic concentration such as the Central Business District. Local streets in residential and commercial areas should be next on the priority list. Maintenance of traffic flow during snow storms is a service that is important to the health and safety of the community, and only very detailed planning and integrated operations can bring it about.

The establishment and management of specialized traffic control procedures and patterns during unusual conditions - such as parades, conventions, and maintenance projects - is another area which requires close cooperation, good communications, and advance planning between Police, Traffic and Parking, and Public Works. Furthermore, it may involve utility companies and other local or national groups.

Relationship to Other Programs and Agencies

The importance of the relationship between planning and operations cannot be over-emphasized in the transportation field. The creation of an elaborate transportation plan without significant attention to operational aspects cannot lead to the fulfillment of the plan's original goal. Perhaps the best example of this can be seen in the planning and construction of the Central Artery and the Sumner and Callahan Tunnels. Here, we have two multi-million-dollar transportation facilities which are extremely important links in the expressway network, and yet circulation between the two is severely hindered by the presence of a few hundred feet of conflicting vehicular and pedestrian movements. In this particular case we also see the need for interagency cooperation. Both

of these facilities were built by different agencies external to the framework of the city government. This relationship between planning and operations is a reversible one. Substantial investments in operational controls and effort can be rendered completely useless by a simple change in a transportation plan. At the present time the major transportation planning function of the City rests within the Boston Redevelopment Authority in its role as the City Planning Department. The operations function, on the other hand, is substantially the responsibility of the Traffic and Parking Department, along with significant inputs from the Police Department and the Public Works Department. CLOSE WORKING RELATIONSHIPS BETWEEN THE STAFFS OF THESE DEPARTMENTS IS VITAL TO THE SUCCESS OF ALL ELEMENTS OF THE TRAFFIC IMPROVEMENT PROGRAM.

Sound management of traffic on the city street system involves a large number of public and private agencies, both within and without the framework of the city government. The Traffic and Parking Department must have a continuous dialogue with the Massachusetts Bay Transportation Authority, for example. Here, the day to day operation of the city street system and the transit system are linked in innumerable ways. The application of bus stops in locations which serve the needs of the bus riders with minimum interference to the flow of other vehicles on the street requires coordination between the two agencies. The location of transit stations on the proposed extensions and relocations vitally affects street circulation in and around the station area. The modernization of the remaining surface trolley lines offers several opportunities for improving traffic operations on the major streets affected. Aside from the large freeway construction program which has already been mentioned, the Traffic and Parking Department has other program areas requiring coordination with the State Department of Public Works. The State DPW has legislative responsibility for approving the design and installation of traffic control devices, and more importantly will be administering the substantial new

funds to be available from the Federal Government for traffic operations programs (TOPICS). The Metropolitan District Commission, the Massachusetts Turnpike Authority and the Massachusetts Port Authority are but three other agencies having substantial transportation responsibilities within the city. In its relationship with all of these outside agencies, the city should aggressively seek those solutions to operations and planning problems which provide the best service within the bounds of available funds. Even though the State DPW has the prime responsibility for planning and building the expressway system, it is the city that will be most affected. The city then must continue and increase its efforts to obtain the best possible design and operating solutions with all of the agencies involved.

Within the structure of the city government, the Police and Traffic and Parking Departments are the most closely related. An ever increasing amount of cooperative work and better communications will be necessary to provide efficient management. The policeman is the "eyes and ears" of the city insofar as activities on the street are concerned. A more effective linking of these eyes and ears to the Traffic and Parking Department can result in quicker identification of problems and more rapid and effective solutions. The installation of the Police Department's new street communication system and the tying together of the communications systems of the two departments will go a long way toward making better utilization of these surveillance resources. The policeman should be encouraged to report relevant traffic problems to the Traffic and Parking Department because it is he who usually first observes the defect such as a burned out signal lamp or other hardware failure. By the same token, Traffic and Parking personnel can be encouraged to report enforcement related events, such as traffic accidents, to the Police Department. Expansion of the vehicle communications system of the Traffic and Parking Department is an important element of this program.

Another area in which the Police and Traffic and Parking Departments are closely related concerns the use of traffic control devices. An expanded program of traffic signalization, for example, can significantly reduce the Police Department's resources which are now allocated to traffic supervision, and this should be considered in future signal programs.

IMPROVED TRAFFIC MOVEMENT

Purpose

This section establishes priorities for a limited mileage of urban arterial streets under jurisdiction of the City of Boston upon which operational improvement programs must be emphasized. The goal has been to define those streets on a priority basis which have major importance in terms of moving traffic and where operational improvements will lead to increased capacity, safety, and a generally improved quality of traffic flow.

Background

The extent and nature of Boston's street congestion problem has been defined and detailed in many previous studies and needs no repetition here. It is useful, on the other hand, to suggest some of the environmental factors which have led to and intensified the congestion problem. First, there is the obvious deficiency in the geometric configuration of the street network. It is ill-defined and in many cases discontinuous to a significant degree. The major arterial facilities often dead-end close to or within the central area. Commonwealth Avenue, which provides an access route from beyond Route 128 and ends at Arlington Street, is a case in point. The rights-of-way along most of the city streets are narrow and often vary considerably along any given street or arterial route. Thus, a major arterial street offers good potential for serving traffic demands on a portion of its route, but the motorist is suddenly confronted with a constricted right-of-way and the resulting bottlenecks are frequently seen. Most of the arterial street facilities in the city have little or no control of access, and the high intensity of abutting land use means that marginal interference with traffic significantly reduces the quality of flow and the capacity potential.

A Priority System

The logical first step in an expanded program of traffic operation improvements is the identification of the major arterial streets which are responsible for moving the major traffic flows within the city. It is clear that only a small portion of the city's 800 miles of street serve primary functions related to arterial street movement. The selection of a limited mileage with assigned priorities in the program will ensure a concentration of effort and this in turn will result in larger benefits for each dollar invested. The preferential street system and its internal priorities which are presented in this section should be viewed as a framework for immediate action, but with the understanding that priorities can and will change in the future. Of particular importance is the monitoring of priorities to take advantage of unexpected opportunities for improvement. The development of an urban renewal plan, for example, may suggest changes in the system and/or rearrangement of priorities which could not be anticipated. Furthermore, since this program relates basically to the movement of motor vehicles and pedestrians on the major street system, it should be recognized that other programs within the Traffic and Parking Department's sphere of responsibility will have their priorities structured on different grounds. For example, the provision for pedestrian crosswalks is most certainly an important aspect of the arterial traffic improvement program. On the other hand, provision of crosswalks on other streets in the vicinity of the city's schools cannot be neglected. In summary, the major street system and suggested priorities is presented both to point out the advantages in cost-benefit terms and to emphasize the appropriateness of the general philosophy of concentrating major efforts on a limited system of street mileage.

System Description

The selection of those routes which comprise Boston's major street system has proceeded with consideration of six basic criteria. They are:

(1) Existing traffic service

(2) Existing bus service

(3) Network continuity

(4) Access to Boston Proper

(5) Circulation within Boston Proper

(6) Access in the crosstown direction

Examination of the city street network with these criteria in mind has resulted in the selection of approximately 93 miles of major streets. These 93 miles, 27 of which are inside Boston Proper, represent approximately 12% of the total street mileage in the city. This 12% is less than the 20% to 35% range which is recommended by the National Committee on Urban Transportation for combined mileage of major arterial and collector facilities. However, when it is considered in combination with the MDC parkway mileage, the proposed system represents a major arterial network which is adequate in scope.

From a physical standpoint the system is characterized by few divided roadways, no access control, a scarcity of multi-lane roadways, and insufficient rights-of-way. These physical deficiencies point up the importance of applying as much operational expertise as possible in order to take full advantage of the available capacity. Most of the streets outside of Boston Proper serve major bus routes, and a few incorporate other types of transit service (trolley lines on Huntington, Commonwealth, Brighton Avenues;the elevated structure on Washington Street). The system

itself has been organized for presentation in the form of routes rather than independent street facilities. This follows the general philosophy that the arterial system should be continuous in nature for maximum operating efficiency. Table I presents a summary of the major arterial routes within Boston Proper and includes an identification number and approximate mileage for each. Functionally, the streets which make up the system in the central area may be classified into the following three groups:

(1) Extensions of the external access routes into Boston Proper

(2) Alternate routes around the core of the central area

(3) Crosstown circulation routes

The 67 miles of arterial routes outside of Boston Proper are listed in Table II. From a functional standpoint these facilities can be grouped into the following categories:

(1) Access to the central area

(2) Crosstown circulation

(3) Access to the expressway and parkway system

Sequence of Action

The definition of the 93 miles of preferential streets from the city's total 800-mile network, is in itself a priority establishment. Nevertheless even within this limited mileage it is necessary to establish further priorities if the traffic improvement program is to proceed in an orderly and efficient manner. This program will involve a relatively large input of technical expertise when compared to the cost of the entire effort. The cost of designing and supervising construction of a major urban freeway is a relatively small part of the total cost, but the cost of engineering design for a signalized intersection is a much more significant portion of the total project cost.

TABLE I
Summary of Major Arterial Routes
Boston Proper

ROUTE IDENTIFICATION Number	Name	Approximate Mileage
10	Beacon-School	2.04
11	Commonwealth	1.10
12	Boylston-Essex	1.84
13	Huntington-Stuart	1.78
14	Columbus	0.91
15	Cambridge-Tremont	2.53
16	Washington	1.90
17	Albany	1.56
18	Atlantic-Commercial	2.22
19	Purchase	0.66
20	Congress-Pearl	1.33
21	Sudbury-No. Washington	0.49
22	State-Court	0.46
23	Summer	0.57
24	Dorchester	0.46
25	Charles-Broadway	1.05
26	Arlington-Herald	1.29
27	Berkeley	1.11
28	Clarendon	0.75
29	Dartmouth	0.78
30	Massachusetts	1.82
31	Franklin	0.42
32	Broad	0.23
	TOTAL =	27.30

TABLE II
Summary of Major Arterial Routes
Outside Boston Proper

ROUTE IDENTIFICATION Number	Name	Approximate Mileage
50	Blue Hill-Columbia	7.59
51	Washington	5.35
52	Columbus-Seaver	3.20
53	Hyde Park	4.50
54	Dorchester	4.86
55	Huntington	1.61
56	Brookline	1.06
57	Cummins	3.25
58	Centre-Spring	4.80
59	American Legion	2.19
60	Old Colony	0.61
61	Broadway	1.81
62	Southampton-Dorchester	1.44
63	Massachusetts	0.95
65	Warren-Washington	4.73
70	Brighton-North Beacon	1.55
71	Washington-Cambridge	2.96
72	Harvard	1.35
73	Commonwealth	4.39
74	Chestnut Hill-Market	1.59
80	Rutherford-Mystic	0.82
81	Main	1.18
90	Meridian	0.89
91	Bennington	2.58
92	Chelsea	1.48
	TOTAL =	66.74

The efficient utilization of limited technical resources is one principal reason for establishing priorities within the 93-mile system. The priorities which are arranged in approximately equal mileage groups (ten in all) are TIME priorities rather than statements of the relative importance of the facilities involved. In arranging the priorities, which are presented in Table III, the streets within Boston Proper were placed high on the priority list. There are several reasons for this action. First, traffic congestion within this area is more serious than in other parts of the city. Secondly, if the program is successful, it is very likely that the arterial routes which enter the central business district will carry additional traffic which has been diverted from residential streets. Obviously, the circulation system within the central area should be operating at peak efficiency before any additional traffic loads are imposed upon it. Thirdly, the economic importance of the central area, both to the city and to the metropolitan region, is self-evident. A subjective analysis has been made of portions of the network which offer a high potential return for the investment of operational dollars. This potential may be due either to large traffic volumes or an existing low level of operating efficiency. At the same time, there has been a concerted effort to organize the program so that work will begin in all corridors of the city at an early date. This will both encourage equal access from all directions and also improve local circulation within all of the city's neighborhoods.

Overall Objective

It is the intent of this report that the priority street groupings set forth should be adopted as the guide for operational improvements. Starting with Group A, each group is to be examined in detail for needed improvements. The improvements are to be programmed and installed as quickly as possible after identification.

It is anticipated that some needed improvements, most likely because of high cost or relation to other programs, will not be possible to achieve immediately. In these cases, all possible improvements, plus interim partial measures which may be necessary, are to be done immediately and the remainder scheduled for earliest possible completion. By this means, it will be feasible to move on to succeeding groups without awaiting completion.

Depending on the flow of State and Federal funds, it is estimated that one-half of the groups can have some improvement by 1970. All will be completed in a 7-year period.

TABLE III
Traffic Improvement Program
Summary of Arterial Priorities

PRIORITY GROUP A

Route Name	Route Number	No. of Section	Street Name	Section Limits From	To	Mileage	
Boylston-Essex	12	1	Boylston	Charlesgate	Exeter	0.69	
		2	Boylston	Exeter	Charles	0.54	
		3	Boylston	Charles	Washington	0.25	
		4	Essex	Washington	Cent. Artery	0.25	
		5	Essex	Cent. Artery	Atlantic	0.11	
					Subtotal		1.84
Cambridge-Tremont	15	1	Cambridge	Charles	Staniford	0.36	
		2	Cambridge	Staniford	Court	0.31	
		3	Tremont	Court	Park	0.21	
		4	Tremont	Park	Stuart	0.40	
		5	Tremont	Stuart	Herald	0.52	
					Subtotal		1.80
Charles-Broadway	25	1	Charles	Cambridge	Beacon	0.35	
		2	Charles	Beacon	Stuart	0.41	
		3	Broadway	Stuart	Washington	0.29	
					Subtotal		1.05
Arlington-Herald	26	1	Arlington	Beacon	Stuart	0.39	
		2	Arlington	Stuart	Tremont	0.20	
					Subtotal		0.59
Massachusetts	30	1	Massachusetts	Beacon	Boylston	0.26	
		2	Massachusetts	Boylston	Huntington	0.35	
		3	Massachusetts	Huntington	Washington	0.59	
		4	Massachusetts	Washington	Southampton*	0.62	
					Subtotal		1.82
ALL PRIORITY GROUP "A" STREETS INSIDE CENTRAL AREA ----------							7.10
Blue Hill-Columbia	50	1	Blue Hill	Boston Line	Morton	1.17	
		2	Blue Hill	Morton	Seaver	1.61	
					Subtotal		2.78
ALL PRIORITY GROUP "A" STREETS OUTSIDE CENTRAL AREA ----------							2.78
TOTAL PRIORITY GROUP "A" STREETS INSIDE AND OUTSIDE CENTRAL AREA							9.88

* Includes rotary pattern at Southeast Expressway ramps

(Table III continued)

PRIORITY GROUP B

Route Name	Route Number	No. of Section	Street Name	Section Limits From	To	Mileage	
Huntington-Stuart	13	1	Huntington	Massachusetts	W. Newton	0.25	
		2	Huntington	W. Newton	Dartmouth	0.36	
		3	Stuart	Dartmouth	Arlington	0.35	
		4	Stuart	Arlington	Washington	0.48	
		5	Kneeland	Washington	Atlantic	0.34	
						Subtotal	1.78
Washington	16	3	Washington	E. Berkeley	Broadway	0.27	
		4	Washington	Broadway	Kneeland	0.24	
		5	Washington	Kneeland	State	0.63	
						Subtotal	1.14
State-Court	22	1	State	Atlantic	Broad	0.19	
		2	State	Broad	Washington	0.17	
		3	Court	Washington	Cambridge	0.10	
						Subtotal	0.46
Berkeley	27	1	Berkeley	Beacon	Stuart	0.38	
		2	Berkeley	Stuart	Tremont	0.31	
		3	E. Berkeley	Tremont	Albany	0.42	
						Subtotal	1.11
ALL PRIORITY GROUP "B" STREETS INSIDE CENTRAL AREA ----------							4.49
Washington	51	1	Washington	W. Rox. Pkwy.	South	1.22	
		2	Washington	South	Forest Hills	1.08	
						Subtotal	2.30
Brighton-No. Beacon	70	2	Brighton	Commonwealth	Cambridge	0.60	
						Subtotal	0.60
Washington-Cambridge	71	3	Cambridge	Brighton	No. Harvard	0.63	
		4	Cambridge	No. Harvard	Cambridge Line	0.48	
						Subtotal	1.11
Harvard	72	3	Harvard	Cambridge	Cambridge Line	0.48	
						Subtotal	0.48
ALL PRIORITY GROUP "B" STREETS OUTSIDE CENTRAL AREA ----------							4.49
TOTAL PRIORITY GROUP "B" STREETS INSIDE AND OUTSIDE CENTRAL AREA							8.98

(Table III continued)

PRIORITY GROUP C

Route Name	Route Number	No. of Section	Street Name	Section Limits From	To	Mileage	
eacon-School	10	4	Beacon	Charles	Park	0.34	
		5	Beacon	Park	Tremont	0.19	
		6	School	Tremont	Washington	0.11	
		7	Water	Washington	Congress	0.09	
					Subtotal		0.73
olumbus	14	1	Columbus	Massachusetts	Dartmouth	0.50	
		2	Columbus, Eliot	Dartmouth	Warrenton	0.41	
					Subtotal		0.91
ongress-Pearl	20	1	Merrimac	Staniford	Sudbury	0.28	
		2	Congress	Sudbury	State	0.27	
		3	Congress	State	Water	0.09	
		4	Congress	Water	Purchase	0.28	
		5	Congress	Purchase	Dorchester	0.15	
		6	Pearl	Water	Purchase	0.26	
					Subtotal		1.33
ummer	23	1	Winter	Tremont	Washington	0.10	
		2	Summer	Washington	Devonshire	0.19	
		3	Summer	Devonshire	Atlantic	0.13	
		4	Summer	Atlantic	Dorchester	0.15	
					Subtotal		0.57
orchester	24	1	Dorchester	W. Fourth	Gillette	0.17	
		2	Dorchester	Gillette	Congress	0.29	
					Subtotal		0.46
LL PRIORITY GROUP "C" STREETS INSIDE CENTRAL AREA ----------							4.00
ashington	51	4	Washington	Forest Hills	Columbus	1.25	
					Subtotal		1.25
olumbus-Seaver	52	1	Seaver	Blue Hill	Walnut	1.12	
		2	Columbus	Walnut	Rox. Crossing	1.08	
		3	Columbus	Rox. Crossing	Massachusetts	1.00	
					Subtotal		3.20
yde Park	53	4	Hyde Park	Cummins Hwy.	Forest Hills	1.58	
					Subtotal		1.58
LL PRIORITY GROUP "C" STREETS OUTSIDE CENTRAL AREA ----------							6.03
OTAL PRIORITY GROUP "C" STREETS INSIDE AND OUTSIDE CENTRAL AREA							10.03

(Table III continued)

PRIORITY GROUP D

Route Name	Route Number	No. of Section	Street Name	Section Limits From	To	Mileage	
Beacon-School	10	1	Beacon	Kenmore Sq.	Dartmouth	0.80	
		2	Beacon	Dartmouth	Arlington	0.36	
		3	Beacon	Arlington	Charles	0.15	
					Subtotal		1.31
Washington	16	1	Washington	Massachusetts	W. Dedham	0.42	
		2	Washington	W. Dedham	E. Berkeley	0.34	
					Subtotal		0.76
Atlantic-Commercial	18	1	Atlantic	Kneeland	Summer	0.23	
		2	Atlantic	Summer	Storer	0.44	
		3	Atlantic	Storer	State	0.15	
					Subtotal		0.82
Purchase	19	1	Purchase	High	Pearl	0.23	
		2	Purchase	Pearl	Summer	0.17	
		3	Central Artery surface	Summer	Kneeland	0.26	
					Subtotal		0.66
Sudbury-No. Washington	21	1	Sudbury	Cambridge	Congress	0.17	
		2	No. Washington	Congress	Lovejoy Pl.	0.32	
					Subtotal		0.49
Clarendon	28	1	Clarendon	Boylston	Beacon	0.25	
		2	Clarendon	Columbus	Boylston	0.25	
		3	Clarendon	Tremont	Columbus	0.25	
					Subtotal		0.75
ALL PRIORITY GROUP "D" STREETS INSIDE CENTRAL AREA ----------							4.79
Blue Hill-Columbia	50	3	Columbia	Blue Hill	S.E. X'way	1.85	
		4	Boston	Columbia	Dorchester	0.91	
					Subtotal		2.76
Dorchester Ave.	54	4	Dorchester	Columbia	E. Fourth	1.41	
					Subtotal		1.41
Huntington	55	2	Huntington	Longwood	Mass.	0.66	
					Subtotal		0.66
ALL PRIORITY GROUP "D" STREETS OUTSIDE CENTRAL AREA ----------							4.88
TOTAL PRIORITY GROUP "D" STREETS INSIDE AND OUTSIDE CENTRAL AREA							9.67

PRIORITY GROUP E

Route Name	Route Number	Section Number	Street Name	Section Limits From	To	Mileage	
ommonwealth	11	1	Commonwealth	Kenmore Sq.	Massachusetts	0.17	
		2	Commonwealth	Mass.	Dartmouth	0.57	
		3	Commonwealth	Dartmouth	Arlington	0.36	
					Subtotal		1.10
umbridge-Tremont	15	6	Tremont	Herald	E. Berkeley	0.17	
		7	Tremont	E. Berkeley	Dartmouth	0.14	
		8	Tremont	Dartmouth	Mass.	0.42	
					Subtotal		0.73
lbany	17	1	Albany	Massachusetts	E. Dedham	0.40	
		2	Albany	E. Dedham	Union Pk.	0.19	
		3	Albany	Union Pk.	Broadway	0.47	
		4	Albany	Herald	Union Pk.	0.50	
					Subtotal		1.56
rlington-Herald	26	3	Herald	Tremont	Washington	0.23	
		4	Herald	Washington	Albany	0.17	
		5	Broadway	Albany	Dorchester	0.30	
					Subtotal		0.70
ranklin	31	1	Franklin	Washington	Congress	0.23	
		2	Franklin	Congress	Broad	0.19	
					Subtotal		0.42
road	32	1	Broad	Cent. Artery	State	0.23	
					Subtotal		0.23
LL PRIORITY GROUP "E" STREETS INSIDE CENTRAL AREA ----------							4.74
ashington	51	5	Washington	Columbus	Dudley	1.16	
		6	Washington	Dudley	Massachusetts	0.64	
					Subtotal		1.80
rookline	56	1	Brookline	Riverway	Park Dr.	0.61	
		2	Brookline	Park Dr.	Kenmore Sq.	0.45	
					Subtotal		1.06
ld Colony	60	1	Old Colony	Preble	Dorchester	0.61	
					Subtotal		0.61
ommonwealth	73	3	Commonwealth	Brighton	B.U. Bridge	0.72	
		4	Commonwealth	B.U. Bridge	Mass.	1.14	
					Subtotal		1.86
LL PRIORITY GROUP "E" STREETS OUTSIDE CENTRAL AREA ----------							5.33
OTAL PRIORITY GROUP "E" STREETS INSIDE AND OUTSIDE CENTRAL AREA							10.07

(Table III continued)

PRIORITY GROUP F

Route Name	Route Number	Section Number	Street Name	Section Limits From	To	Mileage	
Atlantic-Commercial	18	4	Atlantic	State	Hanover	0.53	
		5	Commercial	Hanover	N. Washington	0.36	
		6	Causeway	N. Washington	Merrimac	0.32	
		7	Staniford	Merrimac	Cambridge	0.19	
					Subtotal		1.40
Dartmouth	29	1	Dartmouth	Beacon	Boylston	0.25	
		2	Dartmouth	Boylston	Columbus	0.32	
		3	Dartmouth	Columbus	Tremont	0.21	
					Subtotal		0.78
ALL PRIORITY GROUP "F" STREETS INSIDE CENTRAL AREA ----------							2.18
Huntington	55	1	Huntington	Jamaicaway	Longwood	0.95	
					Subtotal		0.95
Centre-Spring	58	2	Centre	Spring	W. Rox. Pkwy.	1.06	
		3	Centre	W. Rox. Pkwy.	VFW Pkwy.	1.02	
		4	Centre	Arborway	Perkins	1.24	
		5	Centre	Perkins	Columbus	0.61	
					Subtotal		3.93
Brighton-No. Beacon	70	1	N. Beacon	Cambridge	Birmingham Pkwy.	0.95	
					Subtotal		0.95
Rutherford-Mystic	80	1	Mystic	Boston Ave.	Cambridge	0.27	
		2	Rutherford	Cambridge	Prison Pt. Br.	0.36	
		3	Rutherford	Prison Pt. Br.	Charlestown Bridge	0.19	
					Subtotal		0.82
Bennington	91	1	Bennington	Meridian	E. Boston X'way	0.72	
					Subtotal		0.72
ALL PRIORITY GROUP "F" STREETS OUTSIDE CENTRAL AREA ----------							7.37
TOTAL PRIORITY GROUP "F" STREETS INSIDE AND OUTSIDE CENTRAL AREA							9.55

PRIORITY GROUP G

Route Name	Route Number	Section Number	Street Name	Section Limits From	To	Mileage	
Blue Hill-Columbia	50	5	Blue Hill	Seaver	Quincy St.	0.80	
		6	Blue Hill	Quincy	Dudley	0.76	
		7	Hampden	Dudley	Albany	0.49	
					Subtotal		2.05
Hyde Park	53	2	Hyde Park	River	Metropolitan	1.02	
		3	Hyde Park	Metropolitan	Cummins Hwy.	0.68	
					Subtotal		1.70
Dorchester Ave.	54	3	Dorchester Ave.	Adams	Columbia	1.25	
					Subtotal		1.25
Cummins Hwy.	57	1	Belgrade	Centre	Roslindale	1.02	
					Subtotal		1.02
Broadway	61	1	Broadway	Dorchester Ave.	Dorchester St.	0.76	
					Subtotal		0.76
Commonwealth	73	2	Commonwealth	Brighton	Washington	1.17	
					Subtotal		1.17
Chestnut Hill-Market	74	2	Market	Washington	Soldier's Field Rd.	0.64	
					Subtotal		0.64
Meridian	90	1	Meridian	Chelsea Line	Bennington	0.68	
		2	Meridian	Bennington	Chelsea	0.21	
					Subtotal		0.89
TOTAL PRIORITY GROUP "G" STREETS OUTSIDE CENTRAL AREA							9.48

PRIORITY GROUP H

Route Name	Route Number	Section Number	Street Name	Section Limits From	To	Mileage	
Dorchester	54	1	Dorchester Ave.	Milton Line	Talbot	1.06	
		2	Dorchester Ave.	Talbot	Adams	1.14	
						Subtotal	2.20
American Legion Hwy.	59	1	Am. Leg. Hwy.	Hyde Park	Walk Hill	0.91	
		2	Am. Leg. Hwy.	Walk Hill	Morton	0.64	
		3	Am. Leg. Hwy.	Morton	Blue Hill	0.64	
						Subtotal	2.19
Southampton-Dorchester St.	62	1	Southampton	Massachusetts	Dor.Av.	0.80	
		2	Dorchester St.	Dorchester	Broadway	0.64	
						Subtotal	1.44
Massachusetts	63	1	Massachusetts	Southampton	Columbia	0.95	
						Subtotal	0.95
Warren Street - Washington	65	3	Warren St.	Columbia	Walnut	1.40	
		4	Warren St.	Walnut	Mass.	0.87	
						Subtotal	2.27
Washington-Cambridge	71	2	Cambridge	Washington	No.Beacon	0.76	
						Subtotal	0.76
ALL PRIORITY GROUP "H" STREETS OUTSIDE CENTRAL AREA							9.81

PRIORITY GROUP I

oute Name	Route Number	Section Number	Street Name	Section Limits From	To	Mileage	
yde Park	53	1	Hyde Park	Neponset Valley Pkwy.	River	1.22	
					Subtotal		1.22
ummins Hwy.	57	2	Cummins Hwy.	Washington	Hyde Park	0.64	
		3	Cummins Hwy.	Hyde Park	Greenfield	0.87	
		4	Cummins Hwy.	Greenfield	Blue Hill	0.72	
					Subtotal		2.23
entre-Spring	58	1	Spring	VFW Pkwy.	Centre	0.87	
					Subtotal		0.87
arren St.-Washington	65	1	Washington	Morton	Talbot	1.29	
		2	Washington	Talbot	Columbia	1.17	
					Subtotal		2.46
ain	81	1	Main	Medford	City Sq.	0.91	
		2	Warren, Park	City Sq.	Main	0.27	
					Subtotal		1.18
helsea	92	1	Chelsea	Sumner	Chelsea Line	1.48	
					Subtotal		1.48
LL PRIORITY GROUP "I" STREETS OUTSIDE CENTRAL AREA							9.44

PRIORITY GROUP J

Route Name	Route Number	Section Number	Street Name	Section Limits From	To	Mileage	
Broadway	61	2	Broadway	Dorchester Street	Farragut	1.05	
					Subtotal		1.05
Harvard	72	1	No. Harvard	Storrow Dr.	Western	0.45	
		2	No. Harvard	Western	Cambridge	0.42	
					Subtotal		0.87
Chestnut Hill-Market	74	1	Chestnut Hill	Cleveland Cir.	Washington	0.95	
					Subtotal		0.95
Bennington	91	2	Bennington	Chelsea	Saratoga	1.10	
		3	Bennington	Saratoga	Revere Line	0.76	
					Subtotal		1.86
Washington-Cambridge	71	1	Washington	Newton Line	Market	1.09	
					Subtotal		1.09
Commonwealth	73	1	Commonwealth	Lake St.	Washington	1.36	
					Subtotal		1.36
ALL PRIORITY GROUP "J" STREETS OUTSIDE CENTRAL AREA							7.18

CURB SPACE ALLOCATION

Priorities for Review

The task of reviewing and modifying the allocation of curb space on the city's streets is so extensive that it must be approached on a priority basis. The most critical areas of need in this program are those areas which show the highest demand for curb space, and this of course suggests that the central area of the city should be high on the priority list. Since the nature of land use in the city center and the resulting distribution of curb space demand varies so much, it has been subdivided into eight groupings for orderly program action. These eight priority groupings are described in descending order of priority as follows:

1. MARKET AREA - This section of Boston Proper is marked by a high intensity of land use which attracts large numbers of passenger cars and trucks. Its strategic location adjacent to the Government Center, a portion of the retail and financial districts, and its proximity to the waterfront, make it a prime location for curb parking demand. At the same time, existing buildings in the area because of their age have no provision for off-street loading, and this must be accomplished at the curb. All of these factors suggest a reappraisal of the present curb regulation to assure the best possible allocation amongst several conflicting demands.

2. FINANCIAL DISTRICT - This area contains a large part of the CBD's office space, and much of it centers around financial and insurance activity. Portions of the area have seen substantial changes in land use, with prospects for future increases in the intensity of activity. The supply of off-street truck loading is limited. The existing supply of short term curb parking space is likewise restricted, and these factors suggest a potential for increasing service through a detailed review of current practices.

3. RETAIL DISTRICT - The retail core area is almost completely void of metered curb parking, as well as having an extremely limited supply of off-street parking spaces. The high level of commercial activity attracts a substantial volume of truck traffic, and most of this must be serviced at the curb. The importance of this retail center to the well-being of the community establishes it as a high priority area in the program.

4. BACK BAY - The Back Bay has a substantial supply of metered curb parking space which carries a uniform two-hour time limitation. Certain portions of the district are without adequate truck loading zones, and a detailed review is necessary.

5. NORTH STATION DISTRICT - Most of the curb space in the immediate vicinity of North Station has metered parking, and the principal need here is an evaluation of truck loading zones to meet minimum requirements.

6. BEACON HILL - Except for the governmental activities on the easterly side of Beacon Hill, this is largely a residential neighborhood. Because of its proximity to the retail core, Government Center, and the West End redevelopment area, it stands in a high parking demand region. There is virtually no off-street parking supply nor provision for off-street deliveries or loading.

7. NORTH END - Like Beacon Hill, the North End is largely residential in nature, with some commercial activity centered along Hanover Street. The lack of off-street parking space, combined with the relative isolation from any substantial parking areas in adjacent neighborhoods, creates a significant residential parking problem.

8. NEIGHBORHOOD COMMERCIAL CENTERS - As the review and action program progresses through the seven critical areas in the city center, with Jamaica Plain, West Roxbury, East Boston and Brighton getting first attention.

Procedures for Review

In outline form the steps for reviewing curb space allocation are as follows:

A. Inventory of existing conditions

1. Existing regulations
2. Existing allocation of space
3. Existing usage characteristics (turnover, duration, illegal parking, etc.)
4. Existing physical characteristics (street widths, curb cuts, fire hydrants, etc.)
5. Existing traffic volumes

B. Evaluation and definition of needs for moving traffic

C. Allocation of loading zone space

D. Allocation of special zones (taxi, hotel, theatre, etc.)

E. Allocation of metered curb space

Overall Objective

It is the intent of this report that the review of curb space allocation shall begin immediately in the order of established priority. As quickly needed changes are determined, they are to be installed. Relatively small costs are involved -- therefore, the timetable will be mainly tied to delivery schedules for signs and materials.

It is estimated that needed revisions in the first four groups can be completed by 1970.

To avoid delays, any complexities encountered will be set aside for later review.

TRAFFIC SAFETY

TRAFFIC SAFETY

General Objectives

Every well designed and well thought out engineering or enforcement project properly, and of necessity, has an underlying element of increased safety for all concerned. Even though such projects are often undertaken for other basic purposes, careful attention is always given to make certain that no new device or installation will increase hazard and, in fact, every attempt is made to use methods that reduce accident potential. This same philosophy underlies all enforcement programs. It can be expected in fact that well done engineering and enforcement in the long run will provide the greatest increase in the level of safety for the general public.

In spite of the above, there are certain actions which can be undertaken and certain elements of the public which can be addressed directly for the specific purpose of increasing the general safety level. School children in particular and pedestrians in general can properly be made the subject of specific safety programs designed for their own benefit. In addition ot these, action aimed toward improved accident record keeping and analysis, which provides the data for safety programming, can be launched. Finally, expanded public information, which will inform the public of both the purpose of traffic controls and regulations and the potential hazardous consequences of improper performance, can be used as a safety program. This section addresses these elements of traffic safety.

Accident Records

A successful safety program must begin with increased knowledge about the accident phenomenon itself. The magnitude and implications of the accident problem have been documented many times and need no repetition here. Through its relationship to automobile insurance rates, the problem

is one which is felt, at least in financial terms, by every motor vehicle owner.

The Massachusetts Safety Council has recently completed a study of Boston's accident records system and has made a number of recommendations for improving the reporting and investigation element of the safety program. The Task Force is in agreement with the spirit of the Safety Council's recommendations and considers their timing to be especially appropriate. New safety programs at the Federal level are encouraging state and local organizations in their traffic safety effort, and much of the early program emphasis has been on the improvement of record systems, so that future action oriented activities will be based upon sound knowledge of accident causes and situations. Federal funds to implement the program can be made available through the Governor's Highway Safety Committee.

The Task Force recommends that the City take immediate steps to secure a share of Federal and State funds commensurate with the City's share of the accident problem. The goal should be full implementation of the Safety Council's recommendations. For best and quickest results, it is suggested that the entire project be contracted to some available professional organization for them to set up and operate for a reasonable period of time under the administration of the Police Department. By this means, the full benefit, cost and relationship to departmental activities can be evaluated before it is made a permanent part of the City's activities.

Accident Location and Surveillance

A principal part of the records' improvement program must include an accident location and surveillance system which satisfies the engineering needs of the Traffic and Parking Department and the selective enforcement needs of the Police Department. The improvement of the system and the increased use of modern data processing techniques should play an important

role. The goal here, as in other portions of the program, should be to provide more information in a more flexible format and at reasonable cost. The importance of accident location as the key element in engineering physical improvements, cannot be over emphasized, since without good location data, the balance of the data is nearly valueless. The development of workable procedures will require a joint effort on the part of the Traffic and Parking and Police Departments and may very well require the utilization of other resources.

School Crossing Protection

The development of a school crossing protection system contains the following minimum steps:

(1) Development of a school route plan

(2) Study of the relative existing hazards at major crossing points

(3) Analysis of the need for school crossing protection

(4) Selection of appropriate protection measures

(5) Dissemination and education of the plan

Boston has developed an extensive school protection system through the joint efforts of the Traffic and Parking, Police Departments and School Departments. Several years ago, staff members from the departments inspected all major crossing points on the major school routes and defined the appropriate protection measures. There are now approximately 260 points on the system, and 70% of these are controlled by woman supervisors and the remaining 30% by regular police officers. In addition, many of the crossings are controlled by traffic signals and signs. While the available accident data suggests that the program has been very successful, there are several areas which should be strengthened. First, there are some existing vacancies in the authorized complement of woman supervisors, and these vacancies should be filled as soon as practical to relieve this extra burden on the Police Department. Furthermore, the

Police Department should study the possibility of substituting woman supervisors at the locations which are now under the control of police officers. Educational activities emphasizing the school route plan and directed to students and parents can be increased and should have beneficial results. This educational program should be organized with the assistance of appropriate officials of the School Department. Beyond these program elements, there is only a need to review the system annually and adjust it to changes in traffic patterns, residential land use patterns, and school locations.

Public Information

The basic means of communication of traffic control and regulation to the public is through the use of the signs and signals which are posted on the streets. To the greatest extent possible, these are simplified and standardized with the intent that their meaning should be clear to all users of the street system.

A safety program must go beyond this basic system. It must use the other means of communication which are available -- the written word, maps and the spoken word, in person, on radio and on television. The emphasis of such a program because of its direct interest to the individual, can be its safety aspects. Actually, more than this, in the area of understanding and compliance, it can be gained through the same effort.

It is recommended that an expanded program of public information be undertaken. It would have the following basic elements:

1) Communication with affected segments of the public prior to the adoption or installation of a new major regulation so they might understand its purpose and how it works and so they can be given the opportunity to react. The understanding gained through this means can help assure a high level of compliance, leading toward safe behavior.

2) Just prior to the installation of regulations which require significant change in behavior patterns, such as the location of available parking space or the direction of street operations, there should be distributed information to all who will be affected so the change will not come by surprise.

3) A program of general information presented verbally in whatever form is available can be used to develop an increased awareness of the reasons for and need for traffic regulations and controls. This understanding can be expanded into thoughtful compliance with such regulations, which by itself would automatically increase the safety level of the participants.

Pedestrian Protection

All users of the various transportation modes are at one time or another during every journey they make, a pedestrian using a part of the public street system. These pedestrians vary as much as the entire population varies itself in every characteristic which affects behavior in traffic. Some have never driven an automobile and don't fully understand its limitations of performance. Some have infirmities which prevent them from acting as agilely as they might or from perceiving or understanding the hazards which exist. Others might be perfectly capable in all respects, but nevertheless behave erratically in a hazardous situation due to a mood or attitude which might prevail at the moment. All of these persons are entitled to adequate protection and to the most equitable treatment which will enable them to go about their tasks in safety.

Due to the entirely different nature of persons and vehicles, there is no means by which pedestrians can be shielded from the dire consequences of being struck by an automobile. Accordingly, all protections are devised around the philosophy of preventing this occurrence. The two most basic are as follows:

1) Pedestrians are obliged to enter the roadway only at specific locations and under specified conditions. When they behave otherwise, they subject themselves to dangers from which no-one can protect them.

2) Motorists are obliged to respect without fail the rights of pedestrians when they are in the roadway at the proper location and circumstance. They are also obliged to avoid conflict with a pedestrian under any circumstances, although this obligation is not easy of definition.

A pedestrian safety program, of necessity, must be developed around education of both drivers and pedestrians of their individual responsibilities. The vast difference in movement capabilities of pedestrians and motor vehicles suggests that both parties must have a basic understanding of the principles involved. Since the pedestrian is so vulnerable strict enforcement of the traffic laws designed to protect him are recommended. At the same time a practical enforcement program should be instituted which will preserve the integrity of traffic flow by minimizing undesirable pedestrian characterics. To be practical this program must recognize that there are an unlimited number of opportunities for pedestrian crossings and initial efforts must be concentrated on dangerous crossings and flagrant violators.

DETAILS OF TRAFFIC ELEMENTS

DETAILS OF TRAFFIC ELEMENTS

General Objectives

Traffic control devices such as signs, signals, and pavement markings are the physical devices which translate the principles of traffic regulation into operating techniques. It is through the use of these devices that the traffic stream is ordered and regulated. It is these devices which inform and educate the motorist. A few basic underlying principles should be stated at the outset to provide the philosophical framework intended to guide future programs in this area.

First and foremost, traffic control devices should be installed solely on the basis of a need demonstrated by factual information. Secondly, they should be used according to a predetermined set of warrants or guides which define basic minimum criteria for the application of specific devices. Thirdly, the devices should exhibit a uniformity of design to promote a better understanding by the motorist. The use of national design standards is encouraged. Finally, within the bounds of the demonstrated need for these devices, the actual application should provide for an absolute minimum number of installations. Maintaining this minimum number of devices will result in a less complex and more understandable system for the motorist and will also encourage the observance of the regulations which the devices implement.

Pavement Markings

Dollar for dollar, pavement markings are one of the most effective traffic control devices. The existing marking program is concentrated on center lines, lane lines, and pedestrian crosswalks. A simple painted stripe is often the difference between one or two lanes on a city street. The paint line offers a continuous guidance device which is most useful during periods of darkness or adverse weather, and thus has significant safety

advantages. In extreme weather conditions such as fog, the motorist relies upon the center line or lane line as his principal means of guidance. It is recommended that the existing marking program be significantly expanded as soon as possible.

Priorities for center and lane lines should follow those of the priority arterial system. Center and lane lines on the 93 miles of major streets should be repainted semi-annually.

Priorities for pedestrian crosswalk painting are related to the school crossing program and the major street system. On the 93 miles of major streets, crosswalks should be maintained at those locations experiencing significant pedestrian crossing movements. An extensive school protection system has been in operation for some years through the joint efforts of the Police and Traffic and Parking Departments. This involves the maintenance of approximately 300 crosswalks as well as a large number of school traffic supervisors. This program should be maintained at a level which will ensure maximum safety for the city's school children.

Signing

The most numerous control device on the city streets is the traffic sign. The Traffic and Parking Department has estimated that there are approximately 47,000 permanent signs on the city's 800 miles of streets. The Department maintains extensive facilities for the fabrication and erection of signs. Several problems are evident from a review of the sign program.

First, the maintenance of the existing signs is clearly inadequate. In 1966, for example, the Department added approximately 1,800 new signs to the then existing 45,000 installations, while removing approximately 600 signs. The number of signs which were replaced for routine maintenance purposes was only slightly larger than the total number of new signs added. In terms of the entire sign inventory, this means that the average sign on

the street is getting older and older. A most important element of the sign program, then, should be a review of the existing inventory of signs and procedures for periodic maintenance. This inventory, and modernization should concentrate first on the 93 miles of priority streets and should include the identification of regulatory and guide signs which can be removed completely due to changes in regulations or street characteristics.

The review of signing procedures should consider the integration and upgrading of the street name signing program with regulatory and guide sign programs.

Provision must also be made for a continuous surveillance of guide and regulatory signs to ensure that they provide continuity of information to the motoring public. The complexity of Boston's street network, the multiplicity of other agencies with street and highway responsibilities in the city, and the large number of unfamiliar motorists combine to emphasize the importance of the sign as an information and regulatory device.

Traffic Signals

The traffic signal is a device used to increase the safety, capacity, and efficiency of traffic flow at intersections. There are many pitfalls in the use of this device which can lead directly to reductions rather than increases in these three parameters. In this characteristic, the traffic signal may be compared to a drug which by itself may constitute a poison to the human body, but may exhibit miraculous life saving qualities when applied by the experienced medical practioner. History has shown that the indiscriminate use of traffic signals has often led to increased numbers of traffic accidents, lower vehicular operating speeds, increased number of stops and delays, and a general over-all reduction in efficiency and capacity. It is doubly essential, then, that the installation and

maintenance of traffic signals be guided by a set of well established criteria, subject to engineering review on an installation by installation basis. It is also important that consideration be givien to the "systems" concept in the traffic signal program. Traffic flow on each arterial street affects and is affected by the flow on each street which it intersects, and the successful employment of the traffic signal as a metering device must take these interrelationships into consideration.

The Traffic and Parking Department operates approximately 500 signalized intersections in the city, and an additional 100 intersections are within the jurisdiction of the Metropolitan District Commission.

. This system represents a multi-million dollar installation affecting flow on the entire street network. A satisfactory signal program for Boston should be composed of three elements:

(1) Modernization of existing signal hardware and extension of the existing system of interconnected signals.

(2) The installation of new signals at locations where traffic and pedestrian conditions warrant them.

(3) Preventive maintenance designed to eliminate signal failures.

The priorities for each of these program components should follow the 93-mile major street system.

The modernization of existing equipment is dictated both by normal wear and tear and changes in the legislative and administrative standards. In recent years a considerable effort has been extended by the Traffic and Parking Department in changing existing pedestrian signals from the old standard red and yellow indication to the new "walk" and "don't walk" system. The "walk" and "don't walk" indication was adopted by Massachusetts in recent years and follows similar action taken at the national level. While the objective of uniformity in traffic control devices is highly desirable, the adoption of new standards and changes to existing ones have placed

financial hardships upon the city, since no new source of funds has been generally available to implement the changes. There have been substantial technological improvements in traffic signal equipment during the last five years, which have increased the flexibility of the signal to respond to changing traffic patterns. The program must include provision for continual evaluation of the existing signal system with respect to the technological improvements which are available. Furthermore, the city must be alert to existing signal installations which are functionally inappropriate or inadequate and be prepared to take corrective action.

Boston has a substantial number of intersections on its major street system which desperately need regulation and control by traffic signals. Most of these locations are within Boston Proper, and a concentration of effort in this program area following the priorities previously set will be appropriate. Since the installation of a traffic signal can often eliminate the need for a police traffic supervisor, the two activities should be coordinated. There is potential for reallocating a significant amount of police manpower toward better uses with long-run economic benefits as well.

Emphasis on signal maintenance programs should be shifted towards the adoption of a periodic maintenance routine directed toward prevention of signal failures. The failure of a signal can create an especially hazardous situation. Signal lamps should be replaced routinely after a specified period in service, rather than waiting until complete failure of the lamp. Painting, cleaning and lubrication should also be preprogrammed to reduce emergency maintenance and increase signal visibility and effectiveness.

It is the intent of this report that a significant increase in traffic signalling activity be undertaken. Because of the high cost of these devices, considerable capital investment is implied. Fortunately, there are

potential funds for this purpose in the Federal TOPICS program. Only through the use of these programs can the City conceivably bear the costs involved. It is recommended that immediate steps be taken to obtain aid under these programs and that a study project be initiated in conjunction with them which will define the total program and its incident costs.

DETAILS OF PARKING ELEMENTS

General Objectives

Running through the entire program of traffic flow improvement and the proper allocation of curb space are the many details of parking elements which affect both. It has been previously set forth that there should be a priority arterial system for attention and treatment in respect to improved traffic movement. It has also been set forth that there should be priority curb space allocation areas for attention and treatment in respect to use of the curb space. To accomplish these objectives requires the implementation of a number of subsidiary programs which in themselves are of such complexity as to often appear to be independent programs themselves. They are, nevertheless, aimed almost exclusively toward movement, or equitable allocation, or safety or all three and are understandable only in that context.

It must be borne in mind that from a practical point of view, no two blocks of any street and no two streets are identical in their use characteristics and the measures which need be applied. Fortunately, most of the situations are repetitive so that a minimum number of different kinds of controls can be utilized. Nevertheless, they have to be applied on an individual basis to achieve the desired results. The parking elements which go into an adequately developed and controlled system are parking meters, general regulations, enforcement, towing, taxi zones, loading zones and general parking regulations. Each of these must be undertaken under terms of a general philosophy and approach which is then applied individually to the situations which exist. This section addresses these various elements.

Parking Control and Street Cleaning

Proper maintenance of the City's streets requires a special program of parking control. While these maintenance efforts run the gamut from minor short term utility projects to mammoth snow removal operations, the most regular and substantial activity is street cleaning. The regularity of this activity permits the adoption of specific parking regulations and programmed enforcement. Operation of this program has involved a cooperative effort of three City agencies - Public Works, Police, and Traffic and Parking. The over-all objective of keeping the streets clean is important to every citizen. The Task Force feels that the Office of Public Service can play a substantial role in the future by creating and implementing innovative neighborhood programs aimed at stimulating citizen support and cooperation.

Parking Meters

The principles and program elements presented herein cover the parking meter program both in the central business district and the neighborhood centers. Emphasis is directed toward the central business district because the surplus of parking demand over existing parking supply is most pressing in this area.

There has been, and continues to be, widespread misconception about the purpose and function of the parking meter, both by the citizen who the device serves by the legislator and public official who makes it feasible and even by the technician who is responsible for its application. This basic misunderstanding of the role of the parking meter has resulted in a wide variety of both positive and negative opinions about parking meter programs. A statement of the purpose and function of the meter, then, becomes a logical place to begin the review of the program. Simply stated, the parking meter is a control device which is intended to serve the public by providing an equitable distribution of available parking space. This is

a vastly different function from the popular conception of the parking meter as a revenue producing device. The revenue which is produced by the meter program is indeed substantial, but this is a built-in secondary effect which is an indication that the device is being used as intended. The revenues are used to support the costs of supplying and controlling parking, as they should be. The level of fees is set to aid the device perform its time and space rationing function.

Numerous past studies have shown that the parking meter is, in fact, the most efficient and economical means of ensuring that available parking space is shared by the largest number of users. Properly used and fairly enforced, the parking meter serves all segments of the public, and specifically benefits two segments which sometimes have attacked meter programs in the past. In a demand-surplus situation the meter invariably increases the number of users of available curb space, and this clearly benefits the retail merchant who is presented with more potential customers and the motorist who is far more likely to be able to locate a curb space to store his vehicle.

Traditionally, city streets have performed the following major functions:

(1) Supply space for the movement of vehicles and pedestrians.

(2) Supply space for the storage of vehicles.

It is obvious that these two functions compete for the use of a limited street width. On the other hand, it is emphasized that the two functions are not mutually exclusive. The larger the supply of available curb space (within the bounds of parking demand), the smaller will be the amount of excess and unnecessary vehicular travel in search of a parking place. In downtown areas with short supplies of parking space, this excess travel can be significant.

The statement of a few guiding principles can be used to simplify the solution of this allocation problem. First, the analysis of priorities and available alternate courses of action suggest that the demand for movement

of vehicles should take precedent over the demand for parking supply. Insofar as movement is concerned, the street provides the only means of vehicular motion from origin to destination. On the other hand, off-street parking facilities can be used as an alternate, (and in many cases a superior and desirable alternate) solution to the parking supply problem. Secondly, curb parking is an extremely convenient service to the motorist, particularly for providing a short term parking supply. Thirdly, above and beyond the effects of curb parking, the capacity of any given street to move traffic is often limited by other factors. Not every street in the Boston central business district has or can serve the traffic demand of such streets as Boylston, Beacon, Arlington or Tremont. A ban of curb parking on those streets which have little circulation importance serves no useful purpose, and is a waste of a valuable and scarce community resource. In summary, the allocation of street space to movement and parking should be based upon a careful engineering evaluation of the relative service which can be provided with alternate combinations of these two uses.

--Supply

It has already been emphasized that the proper application of parking meters should be limited to areas which have an imbalance of parking demand over supply. In this respect it is helpful to briefly review some aspects of the supply and demand situations within the city. The most detailed statistics which describe supply and demand are available both for Boston Proper as a unit and for the core area within it, and these areas contain the highest concentration of commercial activity. Table IV summarizes the nature of the total parking supply within Boston Proper. It should be noted that a total of approximately 48,000 parking spaces were available in Boston Proper in 1966 (source: Transportation Facts by the Boston Redevelopment Authority). Of these, slightly over 33,000 were located in public and

TABLE IV
Summary of Parking Supply
Boston Proper

	Type of Space	Capacity
1.	Public, off-street, existing	25,004
2.	Private, off-street, existing	8,134
3.	All off-street, existing	33,138
4.	Metered curb, existing (off-peak)	4,258
5.	Unmetered curb, existing (off-peak)	10,464
6.	All curb, existing (off-peak)	14,722
7.	Illegal, curb	16,800

private off-street facilities and 4,200 were available as metered curb spaces. The balance, some 10,500 curb spaces, were located in unmetered areas. For the most part, the supply of unmetered curb space is located in residential areas of the South End which are well removed from the center of demand. In comparison with other large cities with comparable transit usage, there is a considerable net deficit of parking spaces within Boston Proper. Obviously, the demand-supply relationship varies considerably within portions of this large area, and any future meter program should consider this factor. Generalized data describing the demand-supply relationship in the other commercial centers of the city is not readily available, but should be obtained and analyzed as a part of the program.

Table V presents data summarizing the number, general location, and revenue from all parking meters in the city. In all, there are just under 8,400 parking meters on the city streets; all of these are vandal resistant units which were installed several years ago in a major modernization program. About 65% of these meters are located within the central area of the city, and most carry a uniform 2-hour time limitation at the hourly rate of 10 cents. It can be seen that the 5,500 meters in the central area are responsible for over 80% of the revenue, and return an average per meter revenue of close to $140 per year. The per meter revenue from the outlying neighborhood commercial areas is considerably less than the central area, but still remains relatively high in comparison to other cities. Maintenance and repair of the existing meter stock, and collection of the fees therefrom, constitute the basic components of the city's meter program at the present time. All of these functions are performed on an in-house basis by staff members of the Traffic and Parking Department.

In addition to the revenue produced by the meters themselves, parking violations result in additional $2 million (1966) in revenue per year. The

TABLE V
Summary of Parking Meter Revenue
1967

	Area	Number of Meters	Total Revenue	Average Per Meter (Dollars)
1.	Central Area	5,547	769,000	$139
2.	Dorchester	682	41,000	$ 60
3.	Roxbury	428	16,000	$ 37
4.	Brighton	694	30,000	$ 43
5.	Roslindale	146	9,000	$ 64
6.	Forest Hills	29	2,000	$ 74
7.	Jamaica Plain	60	4,000	$ 69
8.	Hyde Park	66	5,000	$ 69
9.	East Boston	261	11,000	$ 40
10.	South Boston	125	7,000	$ 55
11.	Off-street Lots	339	46,000	$136
12.	Miscellaneous	____	7,000	____
	TOTALS ---------	8,377	947,000	$113

bulk of this additional income (75%) results from direct payment of parking fines without court litigation.

--Program Components

The execution of an expanded parking meter program should be composed of the following elements:

(1) Establishment of policies and procedures

(2) Data collection

(3) Maintenance, repair, and installation

High priority should be given to establishment of departmental policies concerning the meter program. The following simple policies are sufficient to ensure a reasonable and useful program:

(1) Metered curb parking space should be provided, maintained, monitored, and enforced on streets in commercial areas showing a demonstrated surplus of parking demand.

(2) The decision to install or remove parking meters should be based upon a factual knowledge of the existing street use for traffic movement, loading, and parking.

(3) The allocation for traffic movement should take precedence over the allocation of street space for parking, but only upon a demonstrated and factual basis.

(4) The selection of time limitations for metered parking should be tailored to demand on a block face by block face basis.

Obviously, these procedures suggest adequate data collection for the proper execution of the parking meter program. There is an extensive parking inventory available for the central business district. This inventory should be kept current and expanded to include the location of all meters in the city on a block face by block face basis. These data should be available both in tabular and graphical form for the most flexibility of use. In addition to this inventory process, the program should institute a continual surveillance procedure which both examines the need for existing

meter installations as well as defines curb facilities which should be metered in the future. Changes in the location of traffic demand, changes in the traffic pattern and volume, alterations to the street network itself, and urban renewal projects are but a few of the elements which suggest a continual review of the meter program. The movement of tens of thousands of people on a complex transportation network is a dynamic situation, subject to frequent change, and any efficient program related either to movement or storage should recognize and provide for this factor. Prior to the actual installation of new meters, the curb facilities involved should be subjected to a detailed study to determine existing turnover and duration, both on the specific facilities involved and in the adjacent area. In addition to turnover information, the knowledge of traffic volumes on the specific street involved and others in the vicinity will be required, as well as physical data describing the street width, the arrangement of curb cuts, existing and proposed loading zones, and the location of other specialized curb uses.

--Other Considerations

The relationship between peak hour traffic flows and off-peak flows should be examined on each individual street, since this will affect the decision of the allocation of space for movement and parking. It should be clear that metered parking can be allowed with peak hour restrictions in those locations where off-peak volumes do not warrant the use of the curb lane for traffic movement. At the same time, the street pattern in the vicinity should be examined to evaluate simple directional changes which might benefit the traffic and parking service.

Boston has a substantial number of narrow streets, and for this reason it is emphasized that standards are necessary for various combinations of parking and traffic conditions. A summary of recommended operational

standards for certain street widths appear in Table VI and are suggested for use as a guide in the meter program. Other factors may preclude parking on streets of these specified widths, but that should be the minimum in which it is allowed.

--Time Limits and Fees

The majority of metered parking spaces in the city now have a uniform 2-hour time restriction. This blanket restriction tends to encourage relatively long term parkers at curb spaces which would be more appropriately used for short term parkers. Such a blanket restriction also ignores the large variations in demand which exist for curb space. An important element of the parking meter program should be a revision of this policy and a review of the entire supply of metered spaces with the goal of tailoring the time restriction to the demand characteristics of the area. At a minimum, the following four (4) time limits should be used: 15 minutes, 30 minutes, 60 minutes, and 120 minutes.

Along with the review of the time restriction, careful consideration should be given to revising the meter rates in a manner that will encourage higher turn-over and provide more space for a larger number of parkers. In general the rates should be increased and varied so that the very short term meters (15 and 30 minutes) carry a premium rate. These combined actions will also discourage "meter feeding".

Revision of the rates will require modification of the meter mechanisms, and it is estimated that approximately 5,000 meters could be affected in the downtown area.

TABLE VI
Summary of Minimum Street Widths

Number of Lanes	Direction of Travel	Minimum Street Parking: 1 side	Width Necessary for Parking: both sides
1	one-way	22 feet	32 feet
2	one-way	32 feet	42 feet
2	two-way	34 feet	44 feet
3	one-way	43 feet	53 feet
4	two-way	54' + Median	64' + Median

Loading Zones

In its Management Study of 1961 the Automotive Safety Foundation had the following comments about the loading zone system in Boston:

> "Curb parking supply is a valuable, limited commodity. Best allocation of its use is important. Street space not needed for moving traffic should go first to passenger and truck loading to reduce the all too prevalent double parking, particularly by trucks. Determining the propriety of loading zones in the hours of operation should be based on set warrants and a factual study of truck use, not on the willingness of the abutting businesses to pay a fee. The entire loading zone system should be abandoned."

Since most retail businesses depend entirely upon truck service for incoming transport of commodities, and since many require the same service for outgoing delivery of goods to customers, provision for adequate loading facilities is an essential function. The alternatives to curb loading are limited in Boston. Narrow street rights-of-way, discontinuous alleys for rear access, and the high cost of structuring new underground or off street facilities all combine to emphasize the importance of a uniform system of curb loading zones. Clearly, then, commodity loading should rank next to the movement of traffic on a priority list of street space uses.

--Existing System

The City of Boston currently operates its loading zone system on a fee basis. Applicants file requests for loading zones with the Traffic and Parking Department. The Department studies the requests, including a field inspection, and either grants the request or denies it. If the request is granted, then the loading zone is established and installed by the City. The applicant pays an annual fee in the amount of $2.00 per foot to maintain the loading zone. This fee covers the cost of painting the curb. Regulatory signs defining the zone are available at the extra cost of $25 (for five years). Certain types of charitable, religious, and nonprofit organizations are exempt from the fee. In all, there are a total of 1300 loading zones throughout the City, with

approximately 300 of these being located in the central area.

Since the initiative for installing loading zones now rests with the business community, the installation of a true system of loading zones as needed is most difficult. Many curb facilities with substantial commercial development do not have loading zone facilities, simply because no one has taken the initiative. It would be very difficult for the City to install a loading zone in a block on its own initiative, while other blocks in the area contain loading zones supported by specific individuals. A problem also arises with respect to the original applicants for these loading zones. Since the applicant pays an annual fee for the zone and since the zone was installed at his request, he naturally assumes that he owns it. Further, it is natural for him to assume that he may use the loading zone as he sees fit. Observations in the field would indicate that some of the existing zones actually serve as parking spaces either for customers or proprietors.

Several problems arise with respect to existing regulations. In the first place, the regulations specify that loading zones operate as loading zones on a 24-hour basis. Since the motorist who is searching for a parking space in the early evening knows that the loading zone will not be used for loading at that hour, he naturally parks in it. This undoubtedly goes a long way in promoting a general disregard for the control itself, and adds to the daytime problem.

A further problem is related to the length of the loading zones as they now exist. Many of the zones are of minimal length (20 to 30 feet) and are thus difficult for trucks to maneuver into and out of. Few of the zones are long enough to accommodate more than one truck at a time. Table VII summarizes the distribution of loading zone lengths within the central area. Just over 50% of the zones are in the 20 to 24-foot category. The most popular length

TABLE VII
Existing Loading Zone Lengths

Length (in feet) of Loading Zones	Percent of Total in Study Area
15 - 19	1.9
20 - 24	51.4
25 - 29	10.8
30 - 34	8.9
35 - 39	2.3
40 - 44	11.2
45 - 49	0.8
50 - 54	4.2
55 - 59	1.2
60 and over	7.3
TOTAL	100.0

observed is 20' with 40% of the total number of zones represented. These data are a clear indication that the fee paid for maintaining the loading zone is more important in determining zone length than is the necessary length for maneuvering trucks in and out of the space.

Enforcement of the existing loading zone and parking regulations also presents operational problems. Existing enforcement is limited to ticketing of illegally parked vehicles, and even when this enforcement procedure is used well, the loading zone is still closed to truck use if it is occupied illegally. Towing of vehicles from loading zones should be used to correct this situation. At the same time, double parking by trucks should be discouraged by rigid enforcement. Both of these enforcement activities will have the effect of encouraging loading zone use by truck drivers.

--Proposed System

It is proposed that the City abandon the existing fee system for loading zones, and initiate a new loading zone program based upon need and administered by the Traffic and Parking Department. The many disadvantages of the existing fee method far outweigh the relatively small amount of revenue which is gained by the City. More importantly, the allocation of curb space for loading of commodities is an essential service to the business community and has a very pronounced effect on the efficiency of traffic flow. Assuming that a logical and satisfactory system can be designed and operated, a significant amount of street space, which is now devoted to illegal commodity loading and unloading, would be returned to its traffic carrying function.

In general, a minimum of one loading zone should be allocated to each block face in commercial and multi-unit residential areas except when the following conditions exist:

(1) There is no demand for loading facilities in the entire block face.

(2) There are sufficient off-street loading facilities.

(3) The street width is inadequate, and traffic flow would be unduly impaired.

(4) The block face is too short.

The current practice is to use block faces where parking is prohibited for loading and unloading. This is legal and does conform to the model traffic ordinance. In most cases observed in the CBD these block faces generate large truck demands, and designation of these block faces as loading zones probably would be more effective than parking prohibition. This presumes that the existing policy of 24-hour operation of loading zones will be reviewed, and a specific time limit introduced.

In theory a mid-block location most adequately serves business development on a typical street. A location near the middle of the block would tend to reduce walking distances and encourage use of the facility. In some cases alleys exist near the middle of the block, and the positioning of a loading zone adjacent to the alley effectively results in increasing the size of the zone from 10 to 15 feet. Other features, such as fire hydrants and driveways, also present the same opportunity to improve the ease of maneuvering in and out of loading zone. Where two loading zones are located in the same block face, logic would position them at one-third points. Locations of freight entrances and elevators and the relative attraction of the varying businesses in a particular block face are other factors to consider in the exact location. The principal intent is, of course, to locate the zone so as to minimize the user's walking distance.

Aside from other operational problems which have been discussed, current practice results in loading zone lengths which are so short as to severely discourage the use of loading zones by truck drivers. For this reason it is

recommended that minimum lengths be adopted. A desirable minimum length for a truck loading zone is 30 feet, and this has been used as the standard. In some cases where the vehicles used are predominantly short wheel-base pick-ups and panel delivery trucks, and station wagons, an absolute minimum of 24 feet might be used. This length, which is 2 feet longer than the standard passenger car parking stall, provides some extra space for rear-end loading and unloading.

As already noted, loading zone regulations are in effect 24 hours a day, 7 days a week. For the most part loading operations are confined to the normal working hours, and the existing loading zone regulation is somewhat illogical. This is clear to the motorist searching for a parking space in the evening, and he frequently uses the loading zone as a parking stall. This encourages a general disrespect for the regulations, and it is suggested that the current policy be reviewed with the aim of providing a more systematic time limitation. It may be that certain loading zone facilities would require extended periods of operation, but it seems clear that the great majority would work perfectly well with a 6 a.m. to 6 p.m. time limitation.

It is recommended that each loading zone facility be posted with signs and delineated with a painted curb. The maintenance of both the signs and the curbs in good condition is important and should assist in the successful operation of the loading zone system. The loading zone signs should carry the time limitations as well as the standard message.

The adoption of the proposed new loading zone procedures would mean a system initiated and controlled by the City. The successful maintenance of the system will depend to an extent on a continuous surveillance to ensure that changes in land use are provided for. The current high level of activity in and out of urban renewal areas will most certainly result in continual changes and modifications to the loading zone system, and this should be recognized and planned for.

Taxi Zones

An important and specialized use of curb space is the provision for exclusive use of limited areas for taxi loading and unloading. Taxi zones are established by the Police Commissioner in accordance with provisions of law. Existing procedures call for close cooperation between the Police and the Traffic and Parking Departments in analyzing the need for taxi zones on a request basis. Since the allocation of curb space for taxi zones is intimately related to other curb uses and the requirements for moving traffic it is recommended that the review function with the Traffic and Parking Department be formalized to assure continuance.

General Regulations

A recent survey of the major street system in the city disclosed a total of 181 different parking control signs. Many of these consisted of minor differences in the application of a standard parking control. The overall picture is that the regulations are numerous and complex enough to present a serious problem.

First, the many different messages create inventory and production difficulties. Secondly, it results in considerable confusion to the average motorist, and lastly it makes the enforcement task much harder. From a practical engineering standpoint there is considerable room for simplifying the parking regulations and specifically reducing the number of different sign messages. There is little reason, for example, for maintaining "No Parking Anytime" signs which carry such various additional information as "cross-walk", "driveway", "at island", "on bridge", "on wall", etc... It would appear that the rather low level of respect for parking regulations has been responsible for the creation of a hierarchy of regulations to further emphasize the importance of each one. Given a fair and uniform enforcement of sensible

regulations, there will be little need for the vast number of explanatory and exclamatory signs. The large number of different signs may also reflect a need to remove outmoded, unnecessary, or otherwise inappropriate signs.

Some distinction must be made at this point concerning the use of "No Parking", "No Standing", and "No Stopping" regulations. The "No Parking" regulation is intended for use in areas of the city having very active concentrations of land use. The demand for access suggests that the curb lane will be used frequently for the temporary loading and unloading of passengers and merchandise. In this situation, then, the "No Parking" regulation by itself will not ensure that the curb lane is available for moving traffic. To ensure that the curb lane is available for moving traffic, the "No Parking" regulation should be used in conjunction with a "No Standing" regulation. Most frequently the "No Parking" regulation would be in effect during off-peak hours and provide for the loading and unloading of passengers and merchandise during this period. During the peak hours the "No Standing" regulation would be applied, and this would allow only the momentary stopping of vehicles for receiving or discharging passengers. In those selected situations where the stopping of a vehicle for picking up or discharging of passengers would present a hazard to other motorists or pedestrians, the "No Stopping" regulation should be used. The difficulty of enforcing the "No Stopping" regulation suggests that it should be used in situations which are more or less self-enforcing. A good example of the proper location for the application of this regulation is the outbound lane of Boylston Street in the block between Tremont and Charles. In this location only one narrow lane is provided for movement in the outbound direction, and the volume of traffic using the lane is high enough so that any stopping of motor vehicles would present substantial delay and hazard to the rest of the traffic stream.

Furthermore, the volume is high enough and the space is clearly restricted enough so that stopping in this location is obviously inadvisable. The motorist who attempts it will undoubtedly be so informed by others behind him.

Existing curb parking regulations should be subjected to a comprehensive and detailed review which is coordinated with the entire program for allocation of curb space. Since the regulation of parking is primarily related to requirements for moving traffic, priorities for this review should follow those recommended for the arterial street system.

Towing

--The Zone Concept

Towing programs are related to many official functions such as snow removal, street cleaning, and accidents - to name a few. This section is primarily concerned with towing activities necessary to maintain traffic flow during normal operating conditions.

The general philosophy of towing parked motor vehicles suggests that this practice should be reserved for those situations where an illegally parked vehicle is jeopardizing the safety of the traffic stream or causing extreme delay and congestion through the blocking of a traffic lane. With this philosophy in mind, it should be clear that the application of tow zones must be restricted to those street facilities which are most important for moving vehicles. It is unlikely, for example, that any but a scarce few tow zones would be needed off of the priority street system previously outlined. The fact that towing is not a penalty in and of itself should be carefully stressed in educational programs directed toward the motorist. The objective of towing is clearly and simply to prevent and correct breakdowns in the flow of traffic by removing parked vehicles which are responsible for these chaotic situations. If a penalty was all that was intended, it would be far more efficient to simply impose a drastically higher fine level for these most

serious situations. If this were done, it would not alleviate the congestion and hazard which the affected motorists in the traffic stream were experiencing.

The city's capability of enforcing the towing regulations is another factor which should be considered in the application of tow zones. In order to be meaningful, the city must have the capability of enforcing the towing regulations in every location that it is applied. This is another argument against the blanket application of tow areas. In the final analysis, tow zones should be so located and so enforced that it is clear without doubt to all motorists why the regulation has been imposed and that immediate enforcement will be undertaken.

--Procedures

At the present time all towing is accomplished through the use of tow vehicles owned by the city and operated by the Boston Police Department or Public Works Department. The relatively small number of tow vehicles, problems with storage of those vehicles which are towed, unmanageably widespread tow zones, and misunderstanding on the part of the public all combine to drastically reduce the effectiveness of the towing procedure as a means of keeping the city's principal traffic arteries open to the motoring public.

A major overhaul of towing procedures is essential to future improvement of operating conditions on the city streets. It is obvious that effective enforcement of towing regulations, even with the reduced number of tow zones as recommended above, is not possible with the present fleet of tow vehicles. The purchase of an adequate number of tow vehicles by the City would be inappropriate because of the relatively short period of use that these vehicles would get each day of the year. While a minimum fleet of vehicles should be maintained by the Police Department, the bulk of the towing program must utilize privately owned tow vehicles. The most feasible method of employing private contractors would be the creation of a list of tow companies who are

interested in providing service to the city. This list should be established through public advertisement and circularization to those tow companies within the city and neighboring communities licensed by the State Department of Public Utilities. Once the list is created, each contractor should be called in rotation with the system weighted according to the number of tow vehicles on the DPU listing.

The central portion of the City, defined as "Zone A", should receive high priority in the tow program, and beyond this important area the rest of the city should be divided into tow districts along the lines of existing police districts. The program should be organized on the police district level with appropriate listings of private contractors available and geographically convenient. The program should concentrate on the priority street system in all areas of the city. Within each of the districts it will be necessary to define a storage place for those vehicles which have been towed. The question of whether or not these storage areas should be operated by the city or by private contractors has been explored. Within the central area operation of the storage lots should be by city personnel attached either to the Police or Traffic and Parking Departments. Outside of the central area the question has not been resolved, but the alternate solution of storage by private contractors appears to be more feasible than it is in the downtown area.

There are several alternate possiblities for storage space in the central area. At this time the most feasible location is a city owned parking lot under the Central Artery. This lot (identified as No. 88 on the BRA parking inventory) is adjacent to North Washington Street and can accommodate approximately 60 vehicles. It is particularly convenient because of its proximity to the new police station on Sudbury Street and its centralized downtown location. Some administrative problems connected with the use of this lot remain to be resolved. The added capacity of lot No. 88, combined with the

existing reserved spaces in the Common Garage, are still inadequate, and additional storage space must be found to accomodate an expanded program.

Enforcement

In recent weeks the broadened authority of the Parking Meter Supervisors, along with their reassignment to the downtown area, has resulted in a substantial increase in the level of parking enforcement and a corresponding improvement in the flow of traffic. Much work remains to be done, however. First, the review of parking regulations, a more equitable allocation of curb space - particularly an increase in the supply of truck loading zones, and a simplification of the regulations themselves are important to more effective enforcement. Secondly, a substantial increase in the number of "meter maids" is necessary to provide adequate enforcement, both in the CBD and along the arterial routes and neighborhood shopping centers.

As the number of meter maids increases and their area of effectiveness broadens, the Traffic and Parking Department will find it necessary to make further provisions for administration of the program. Present working space at the Traffic and Parking headquarters at Southampton Street is inadequate, even for the current staff, and new space must be provided for a headquarters. Several alternate possibilities for use by the meter maids have been investigated and these have included old Police Station 16 on Boylston Street and the present City Hall. Both of these buildings satisfy geographic requirements for the meter maid force, but extensive rennovations would be necessary to Station 16.

Once the enforcement program in the downtown area begins to change parking habits and educate the motorist, the emphasis should shift to the arterial street system outside of the downtown area. Anticipating this eventual shift in operations activity, the Traffic and Parking Department should investigate

methods of improving the operational efficiency of the meter maids under these different conditons. Specifically, it is most likely that some means of motor vehicle transportation would be more appropriate along the arterial routes, and the advantages and disadvantages of the alternate types of vehicles such as the 3-wheel motor scooter should be thoroughly investigated.

PROGRAM ADMINISTRATION

Implementing the Plan

The translation of the ideas and concepts described in this report into the reality of improved traffic conditions can be accomplished only by the concerted and continued effort on the part of many city officials and employees. The success of the program depends in large part on an understanding of the goals and objectives by the staff members responsible and a realization that the job can indeed be done. The task is surely a complex and difficult one, and the dynamic nature of the transportation picture guarantees a continuing stream of new problems which must be solved, new obstacles which must be hurdled, and new irritations which must be ignored. The immensity of the job and the pitfalls which lie in the path toward success should offer a meaningful challenge to each and every staff member in the city departments which are affected. Specific goals which must be attained to establish and maintain the momentum for a successful program are:

(1) The upgrading of the Traffic and Parking Department staff

(2) The integration of traffic planning and operations activities

(3) The measurement of program progress

There is much thinking which has to be done, many analyses to be completed, and many decisions to be made in the future. Technical resources will account for a large and critical proportion of the total program.

Traffic and Parking Department Staff

The pressures of ever rising traffic volumes, congestion, and accident losses have stimulated a substantial amount of technological change in the traffic field during recent years. This trend, combined with the new emphasis on traffic operations contemplated by the city, dictates a general upgrading of the

technical resources of the Traffic and Parking Department. Several alternate courses of action can be followed in pursuing this beefing up of the technical staff.

First, the city could encourage staff members to continue their education either on a part-time or full-time basis. Many of the universities in the Boston metropolitan area offer course work in transportation and related fields. Full-time graduate work would, of course, require an extended leave of absence in order to take advantage of one of the several outstanding transportation curriculums offered at schools outside of the New England area. Encouragement of this type of continuing educational program must take the form of job-related incentives.

A second course of action, which is common in private industry would be the establishment of an in-service training and educational program. The Department could set up and manage a specific program of transportation courses to be offered to staff members. Instructors could be drawn from the ranks of the many universities in and out of the Boston area, public agencies, and practicing consulting firms. These courses could be finely tailored to satisfy a specific personnel need, but should also provide for a broadened outlook on the part of individual staff members.

Lastly, the city could resort to a recruitment program designed to fill existing positions which are vacant and those which may be created as ingredients of the new program. It is the Task Force's belief that the Traffic and Parking Department will find it necessary to use several or all of the above approaches. There is a well-documented shortage of trained and experienced traffic engineers, and the recruitment of new personnel will certainly not be easy. Taking advantage of routine avenues of educational advancement is necessarily time consuming, and while this bodes well for the future, the need to

improve traffic conditions is here now and the job must be started. The concept of in-service training and educational program can be implemented in a very short time and, if properly executed, can begin paying dividends in a matter of months.

The mere application of more traffic control devices and regulations in a haphazard manner without goal can do more harm than good. It is only through sound planning, good organization, and intelligent application that the program objectives can be reached, and the key ingredient here is people.

Traffic Planning and Traffic Operations

Transportation planning and operations are mutually dependent activities. The best transportation plan is the one which both satisfies the planning goal and meets high operating standards. The Boston Redevelopment Authority, through its city planning function, has responsibility for transportation planning for the City of Boston, whereas operational functions are delegated to the Traffic and Parking Department. The two agencies have created the necessary mechanisms to coordinate their work in a relatively efficient manner which eliminates duplication of effort. Nevertheless, the two activities are so interrelated that they require day-to-day contact. The transportation planner must be aware of the operational aspects of the plan he is preparing, and this is best done step by step throughout the process of plan development, rather than in later stages.

The integration of planning and operations activity has administrative difficulties attached to it, but they should not be allowed to becloud the basic issue. The Task Force firmly believes that transportation planning and operation must be functionally and administratively unified if the full benefit of future programs is to be gained, and recommends a thorough and careful study to define the best way of accomplishing the objective.

Program Evaluation

It will be necessary in the future to make substantial improvements to the Traffic and Parking Department's information system if it is to monitor progress in the operations program. Evaluating past efforts, plotting changes in demand, and programming new courses of action will be necessary steps as the program develops. Just as the airplane or ship's navigator finds it necessary to maintain a continual "fix" on

his vehicle's path, managers of the traffic operations program must repeatedly ask the questions: "What were our objectives?", "How have they changed?", "What has the program accomplished?", "What remains to be done?", and "Where do we go from here?".

There is certainly no lack of transportation data in Boston and the metropolitan region. The very abundance of traffic counts, origin-destination studies, speed and delay studies, and other miscellaneous works attest to the importance and complexity of transportation problems. There is, however, a need to re-order this data so that it provides more information to the technician and the administrator.

This need resolves itself into two basic objectives. First, the methods and procedures which now exist for data collection activity should be partially restructured so that the system is capable of indicating TRENDS. Accomplishing this goal will enable the program administrator to measure the results of the program activities as well as provide the means for adjusting the program to changes in traffic and land use patterns. Secondly, the Traffic and Parking Department must seriously consider the advantages of modern data processing techniques as they may be applied to planning and operations programs. Many of the Department's activities involve the handling of very large volumes of data. The meter maids, for example, issue hundreds of thousands of parking tickets, and the expansion of the force will see an increase in the number of tickets issued. It is entirely possible that modern techniques of data processing could substantially improve operating efficiency in this and many other activities, and this question deserves serious attention at the present time.

APPENDIX

APPENDIX

1. "A Comprehensive Development Program for Public Transportation in the Massachusetts Bay Area", a report dated May, 1966, prepared by the Massachusetts Bay Transportation Authority planning staff.

2. "Guidelines for the Traffic Operations Program to Increase Capacity and Safety (TOPICS)", U.S. Department of Commerce, Bureau of Public Roads, IM 21-7-67.

3. "Street Priorities", 2 maps, dated October 1968: on file at the Traffic and Parking Department.

4. "Loading Zone Study" Report dated June, 1967, prepared for BRA by Murray D. Segal, Transportation Consultant, on file at the Traffic and Parking Department and at the Boston Redevelopment Authority.

5. "A Study of Traffic Accident Records System in the City of Boston", report dated December, 1967, prepared by the Massachusetts Safety Council, Inc. for the Boston Redevelopment Authority, on file at the Traffic and Parking Department, the Police Department and the Boston Redevelopment Authority.

6. "Proposed Parking Meter Installations", map dated October, 1968, and list on file at the Traffic Department.

7. "A Study of School Crosswalks from a List submitted by the Division Captains of the Police Department in preparation for the proposed assignments of Women Police Supervisors", report dated November, 1962, prepared by Officer Donald Nelson, Traffic Consultant to the Police Commissioner and Ralph Kouroyen, Assistant Traffic Engineer, Traffic and Parking Department, on file at the Traffic and Parking Department and at the Police Department.

8. "List of Public Hackney Stands" prepared from card file maintained by Boston Police Department; cards on file at the Police Department, and the list on file at the Traffic and Parking Department.

9. "Existing Taxi Stands" map dated October 18, 1968 on file at the Traffic and Parking Department.

10. "Recommended Regulations for "All Rolling Areas" - map and list on file at the Traffic and Parking Department.

11. "Transportation Facts for the Boston Region" - 1967 Edition - Compiled by the Transportation Department, Boston Redevelopment Authority.